

Pediatric EKG Quiz Answers

4/04

1. The T wave in lead **V1** generally inverts by day 3-4 of life, unless a child has right ventricular hypertrophy or a congenital defect causing excess right sided forces. Occasionally subsequent V waves can also invert, although generally less so than V1. Usually the t-wave in V1 will become upright in adolescence, but occasionally will persist to adulthood.
2. Some authors suggest that ischemia is appreciated very differently in pediatric versus adult EKGs and that the most sensitive sign is **any q wave greater the 0.35 sec in width**, regardless of whether signs of ischemia exist in the other leads of that anatomic distribution. Along with the obvious ST elevation, prolongation of the QT interval may indicate ischemia in the pediatric population.
3. Not surprisingly, the EKG is TA often shows **right atrial enlargement**, which is indicated by a peaked P-wave higher than 3mm in any lead (but best appreciated in 2,3, or V1). Peaked Ts are generally seen in hyperkalemia or early myocardial infarction, while QT prolongation can be congenital or secondary to medications or ischemia.
4. Thankfully, **90%** of patients with familial hypertrophic cardiomyopathy will demonstrate some abnormality, including left ventricular hypertrophy (R is V6 or S in V1 above 98% for age), atrial enlargement (p-wave >0.1 seconds), or ST-T wave changes.
5. **Measured QT (seconds)/ the square root of the RR interval (seconds)**
6. The delta wave, a slow upslurring of the QRS complex causing slight widening on a sinus rhythm EKG, represents the depolarization of the ventricle through both the AV node and the accessory pathway. It is best seen in leads **1, V5, and V6**
7. **Early repolarization** can cause ST elevation in the anterior, and occasionally inferior, leads of the EKGs of healthy adolescents. Right bundle branch block may be seen in the EKGs of normal children, but left bundle branch block is not. Hypokalemia causes T wave flattening, and ischemia is clearly not benign.
8. While **transposition of the great arteries** is not the most common of the cyanotic congenital heart lesions, it is the most common to present with cyanosis within the first few days after birth. These babies do have greater than normal right-sided forces, but in the first few days normal babies have high right sided forces as well, so the EKG does not look necessarily abnormal. The EKG in truncus arteriosus will frequently show biventricular hypertrophy. Patients with tricuspid atresia often have the appearance of left ventricular hypertrophy secondary to the loss of right ventricular force and, 15% of the time, will have an associated first degree AV block. Tetralogy of Fallot may have a normal EKG, but, while it is the most common of the cyanotic congenital heart diseases, it is not the most common to present in the early neonatal period and may present much later with “tet spells” later in the first year of life.
9. Any surgery which requires cutting around the AV node is going to predispose a patient to PR prolongation. The most common of these is **ventricular septal defect** repair. The other surgeries would be much less likely to damage the AV node as they are usually farther from it.
10. **Right bundle branch block** can also complicate a VSD repair, as well as a Tetralogy of Fallot repair (in >50% of cases) or a Rastelli procedure. Clearly, any complications are possible, but, again, anatomically, atrial arrhythmias are less likely than ventricular and MFAT in particular is

extremely uncommon in the pediatric population. In the near future, hopefully, certain VSDs will regularly be closed by a catheterization procedure, rather than an open surgery, significantly decreasing the risk of post-operative arrhythmias.